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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,830	09/22/2003	Mats A. Brenner	Honeywell No. H0004501	1008

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EXAMINER	
NGUYEN, TUAN HOANG	
ART UNIT	**PAPER NUMBER**
2618	

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,830	BRENNER, MATS A.	
	Examiner	Art Unit	
	Tuan H. Nguyen	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-33, and 36-44* is/are rejected.

7)☒ Claim(s) *2,3,34 and 35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 12/24/2003 and 04/26/2004 has been considered by Examiner and made of record in the application file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4-7, 16-17, 26-27, and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Mannermaa Jari (European Patent Application number EP 1 102 415 hereinafter, "Mannermaa").

Consider claim 1, Mannermaa teaches a method of monitoring radio frequency interference (RFI) in a satellite signal, wherein the satellite signal includes a carrier signal, the method comprising: calculating a statistical variance estimate (V) based on a plurality (K) of discriminator values (d_k) formed in a carrier tracking loop (page 4 lines

38-55); and calculating an RFI detector from the statistical variance estimate (page 5 lines 52-56).

Consider claim 4, Mannermaa further teaches the RFI comprises continuous wave RFI (page 5 lines 5-9).

Consider claim 5, Mannermaa further teaches the RFI comprises narrowband RFI (page 5 lines 5-9).

Consider claim 6, Mannermaa further teaches the RFI comprises continuous wave RFI and narrowband RFI (page 5 lines 5-9).

Consider claim 7, Mannermaa further teaches the carrier tracking loop comprises a phase-locked loop (page 5 lines 36-38).

Consider claim 16, Mannermaa further teaches wherein K is 100 (page 5 lines 42-45).

Consider claim 17, Mannermaa further teaches each of the plurality of the discriminator values is formed from in-phase and quadrature-phase components of the satellite signal (page 6 lines 23-29).

Consider claim 26, Mannermaa further teaches the carrier tracking loop is implemented in a receiver (page 5 lines 29-36).

Consider claim 27, Mannermaa further teaches the receiver comprises a plurality of tracking channels, each tracking channel for tracking one satellite signal, and wherein the RFI detector is calculated for each of the plurality of tracking channels (page 5 lines 29-49).

Consider claim 29, Mannermaa further teaches machine language instructions stored on a machine-readable medium (page 6 lines 43-44).

Consider claim 30, Mannermaa further teaches the machine-readable medium is a data storage element readable by a microprocessor (page 6 lines 43-44).

Consider claim 31, Mannermaa further teaches the RFI is present in a pass band of the carrier signal (page 2 lines 36-39).

Consider claim 32, Mannermaa further teaches the RFI is present in a pass band of the carrier tracking loop (page 2 lines 40-45).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannermaa Jari (European Patent Application number EP 1 102 415 hereinafter, "Mannermaa") in view of Horslund et al. (US PAT. 5,983,160 hereinafter, "Horslund").

Consider claim 8, Mannermaa teaches a method of monitoring radio frequency interference (RFI) in a satellite signal (page 4 lines 38-55).

Mannermaa does not explicitly show that the phase-locked loop is a Costas loop.

In the same field of endeavor, Horslund teaches the phase-locked loop is a Costas loop (col. 1 lines 38-49).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, the phase-locked loop is a Costas loop, as taught by Horslund, in order to provide a system and method for increasing jamming immunity in a GPS/INS system.

Consider claim 9, Horslund further teaches the carrier tracking loop comprises a frequency-locked loop (col. 8 lines 27-48).

Consider claim 10, Horslund further teaches the carrier tracking loop comprises a phase locked loop and a frequency-locked loop (col. 8 line 27 through col. 9 line 14).

Consider claim 11, Horslund further teaches the carrier tracking loop has a first mode of operation and a second mode of operation, wherein the first mode of operation is a phase-locked operation and the second mode of operation is a frequency locked operation, and wherein a first RFI detector is formed when the loop operates in the first mode and a second RFI detector is formed when the loop operates in the second mode (col. 8 line 27 through col. 9 line 14).

6. Claims 12-15, 18-25, 33, 36-42, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannermaa Jari (European Patent Application number EP 1 102 415 hereinafter, "Mannermaa") in view of Lomp et al. (US PAT. 5,799,010 hereinafter, "Lomp").

Consider claim 12, Mannermaa teaches a method of monitoring radio frequency interference (RFI) in a satellite signal (page 4 lines 38-55).

Mannermaa does not explicitly show that the RFI detector is defined as a root-mean-square (RMS) of the discriminator value.

In the same field of endeavor, Lomp teaches the RFI detector is defined as a root-mean-square (RMS) of the discriminator value (col. 51 lines 32-33).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, the RFI detector is defined as a root-mean-square

(RMS) of the discriminator value, as taught by Lomp, in order to process a plurality of information signals received by a Radio Carrier Station over telecommunication lines for simultaneous transmission over a radio frequency channel as a code-division-multiplexed signal to a group of Subscriber Units.

Consider claim 13, Lomp further teaches the RFI detector is derived from a square root value of the statistical variance estimate (col. 51 lines 32-33).

Consider claim 14, Lomp further teaches each of the plurality of the discriminator values is formed at a periodic interval (col. 28 lines 9-16).

Consider claim 15, Lomp further teaches the periodic interval is 0.01 seconds (col. 28 lines 31-33).

Consider claim 18, Lomp further teaches determining whether a loss of lock of the carrier tracking loop has occurred by determining whether the RFI detector exceeds a threshold value (col. 52 lines 57-63).

Consider claims 19 and 23, Lomp further teaches the threshold value is determined by simulating a response of the carrier tracking loop to CW and narrowband RFI (col. 44 line 55 through col. 45 line 3).

Consider claim 20 and 24, Lomp further teaches the threshold value is 0.6 radians (col. 49 lines 54-61).

Consider claim 21 and 25, Lomp further teaches the threshold value is adjusted based on a signal-to-noise ratio of the satellite signal (col. 65 lines 46-60).

Consider claim 22, Lomp further teaches determining whether a cycle slip of the carrier tracking loop has occurred by determining whether the RFI detector exceeds a threshold value (col. 52 lines 57-63).

Consider claim 33, Mannermaa teaches a method of monitoring narrowband and continuous wave RF interference in a system comprising a plurality of satellites transmitting a respective plurality of satellite signals, at least one reference receiver and a ground station, wherein the at least one reference receiver receives the satellite signals from the plurality of satellites, the method comprising: calculating a statistical variance estimate (V) for each satellite signal based on the plurality (K) of discriminator values (d.sub.k) (page 4 lines 38-55); and calculating an RFI detector from the statistical variance estimate (page 5 lines 52-56).

Mannermaa does not explicitly show that forming for each satellite signal, a plurality of discriminator values (d.sub.k) based on processing, in a carrier tracking loop included within one of the at least one of reference receivers, a carrier signal associated with the satellite signal.

In the same field of endeavor, Lomp teaches forming for each satellite signal, a plurality of discriminator values (d.sub.k) based on processing, in a carrier tracking loop included within one of the at least one of reference receivers, a carrier signal associated with the satellite signal (col. 72 lines 4-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, forming, for each satellite signal, a plurality of discriminator values (d.sub.k) based on processing, in a carrier tracking loop included within one of the at least one of reference receivers, a carrier signal associated with the satellite signal, as taught by Lomp, in order to process a plurality of information signals received by a Radio Carrier Station over telecommunication lines for simultaneous transmission over a radio frequency channel as a code-division-multiplexed signal to a group of Subscriber Units.

Consider claim 36, Mannermaa further teaches the step of calculating the RFI detector is carried out in the at least one reference receiver (page 6 lines 20-24).

Consider claim 37, Lomp further teaches the at least one reference receiver measures a pseudorange for each received satellite signal and transmits the RFI detector to the ground station along with the pseudorange, and wherein the ground station calculates differential corrections using the pseudorange transmitted from the at least one reference receiver (col. 43 lines 54-63).

Consider claim 38, Lomp further teaches the ground station compares the RFI detector to a threshold value and excludes the pseudorange from the differential calculations if the RFI detector exceeds the threshold value (col. 52 lines 57-63).

Consider claim 39, Lomp further teaches the threshold value is indicative of a loss of lock of the carrier tracking loop of the at least one reference receiver (col. 2 lines 57-63).

Consider claim 40, Lomp further teaches the threshold value is indicative of a cycle slip of the carrier tracking loop of the at least one reference receiver (col. 52 lines 57-63).

Consider claim 41, Mannermaa further teaches the step of calculating the RFI detector is carried out in the ground station (page 4 lines 14-19).

Consider claim 42, Mannermaa further teaches storing the RFI detector in a data storage element of the ground station (page 4 lines 14-19); and quantifying the levels of the CW and the narrowband RF interference present in the ground station by evaluating a time history of the RFI detector over the plurality of satellites (page 7 lines 6-11).

Consider claim 44, Mannermaa teaches a method for monitoring continuous wave and narrowband interference in a pass band of a satellite carrier signal, the

method comprising in combination: means for estimating a statistical variance among a plurality of discriminator values formed in a tracking loop, wherein the tracking loop tracks the satellite carrier signal (page 4 lines 38-55); means for calculating a standard deviation value from the statistical variance estimate (page 5 lines 52-56).

Mannermaa does not explicitly show that comparing the standard deviation value to a threshold value; and detecting an RFI fault when the standard deviation value exceeds the threshold value.

In the same field of endeavor, Lomp teaches comparing the standard deviation value to a threshold value (col. 44 line 55 through col. 45 line 3); and detecting an RFI fault when the standard deviation value exceeds the threshold value (col. 52 lines 57-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, comparing the standard deviation value to a threshold value; and detecting an RFI fault when the standard deviation value exceeds the threshold value, as taught by Lomp, in order to process a plurality of information signals received by a Radio Carrier Station over telecommunication lines for simultaneous transmission over a radio frequency channel as a code-division-multiplexed signal to a group of Subscriber Units.

7. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mannermaa Jari (European Patent Application number EP 1 102 415 hereinafter, "Mannermaa") in view of applicant admitted prior art.

Consider claim 28, Mannermaa teaches a method of monitoring radio frequency interference (RFI) in a satellite signal (page 4 lines 38-55).

Mannermaa does not explicitly show that the satellite signal is selected from the group consisting of a GPS, GLONASS, Galileo, WAAS, and EGNOS signal.

In the same field of endeavor, applicant admitted prior art teaches the satellite signal is selected from the group consisting of a GPS, GLONASS, Galileo, WAAS, and EGNOS signal (page 3 lines 7-9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, the satellite signal is selected from the group consisting of a GPS, GLONASS, Galileo, WAAS, and EGNOS signal, as taught by applicant admitted prior art, in order to monitoring and detecting continuous wave and narrowband radio frequency interference in a satellite signal pass band.

8. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mannermaa Jari (European Patent Application number EP 1 102 415 hereinafter, "Mannermaa") in view of Lomp et al. (US PAT. 5,799,010 hereinafter, "Lomp") as applied to claim 33 above, and further in view of applicant admitted prior art.

Consider claim 43, Mannermaa and Lomp, in combination, fails to teaches the system is selected from the group consisting of LAAS, WAAS, and EGNOS.

However, applicant admitted prior art teaches the system is selected from the group consisting of LAAS, WAAS, and EGNOS (page 4lines 14-19).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of applicant admitted prior art into view of Mannermaa and Lomp, in order to monitoring and detecting continuous wave and narrowband radio frequency interference in a satellite signal pass band.

Allowable Subject Matter

9. Claims 2-3 and 34-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any response to this action should be mailed to:

Mail Stop_____ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Facsimile responses should be faxed to:

(571) 273-8300

Hand-delivered responses should be brought to:

Customer Service Window

Randolph Building

401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571) 272-8329.. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information Consider the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Nguyen T-N
Examiner
Art Unit 2618

9/12/06

QUOCHIEN B. VUONG
PRIMARY EXAMINER